

**Current status of the claims:**

1. **(Previously amended)** A low energy method of pyrolysis of hydrocarbon material comprising:
  - providing said hydrocarbon material;
  - loading said hydrocarbon material into a reaction chamber;
  - adding a clay and metal dust catalyst to said reaction chamber, and
  - heating said reaction chamber for a sufficient time to provide substantially complete pyrolysis,
 said method occurring while maintaining a vacuum in said reaction chamber and yielding reaction products comprising a substantially non-charred and non-oxidized solid residue having minimal unpyrolyzed material, a substantially non-oxidized and polyaromatic hydrocarbon-free liquid hydrocarbon product and a combustible gas.
2. **(Original)** The method of Claim 1, wherein said clay is selected from the group consisting of montmorillonite, bentonite, beidillite and combinations thereof.
3. **(Original)** The method of Claim 1, wherein said clay is pillared clay.
4. **(Original)** The method of Claim 1, wherein said clay is a natural ore.
5. **(Original)** The method of Claim 1, wherein said clay is a commercial clay containing product.
6. **(Original)** The method of Claim 5, wherein said commercial clay product is selected from the group consisting of cat litter and oil spill absorbent and combinations thereof.
7. **(Original)** The method of Claim 1, wherein said clay and metal dust catalyst is added in an amount of about 0.01 wt.% to 3.0 wt.%, based on the total weight of said hydrocarbon material.
8. **(Original)** The method of Claim 1, wherein the metal dust is added to the clay in a ratio of between about [0.1 to 2]:[0.1 to 2]:[8] of [Al] [Mg] [clay].
9. **(Original)** The method of Claim 1, wherein said metal dust is added in a ratio of between about [0.5 to 1]:[0.5 to 1]:[8] of [Al] [Mg] [clay].
10. **(Original)** The method of Claim 1, wherein said metal dust is comprised of a mixture of aluminum and magnesium.
11. **(Original)** The method of Claim 1, wherein said metal dust is comprised of aluminum or magnesium.

12. **(Original)** The method of Claim 1, wherein said metal dust comprises Al particles of less than about 200 mesh size and Mg particles of less than about 325 mesh size.

13. **(Original)** The method of Claim 1, wherein said heating of said reaction chamber results in a reaction temperature of said hydrocarbon material of between about 150° to 850° F.

14. **(Original)** The method of Claim 13, wherein said reaction temperature of said hydrocarbon material is maintained for a period of time sufficient to complete pyrolysis.

15. **(Original)** The method of Claim 1, wherein said heating occurs in at least a first, second and third phases and fuel input is adjusted to take advantage of the exothermic nature of the reaction.

16. **(Original)** The method of Claim 15, wherein said heating in said first phase maintains a reaction temperature of between about 450° - 850°F, for a period of time adequate to initiate pyrolysis.

17. **(Original)** The method of Claim 15, wherein said heating in said second phase maintains a reaction temperature of between about 450° - 850°F, for a period of time adequate to provide continued pyrolysis.

18. **(Original)** The method of Claim 15, wherein said heating in said third phase maintains a reaction temperature of between about 450° - 850°F, for a period of time adequate to provide completion of pyrolysis.

19. **(Original)** The method of Claim 15, wherein said first, second and third phase occur sequentially over time.

20. **(Original)** The method of Claim 15, wherein said first, second and third phase occur sequentially over space, as said hydrocarbon material moves through said reaction chamber.

21. **(Original)** The method of Claim 1, wherein said vacuum is maintained at a pressure of between about 2 inches to 16 inches mercury.

22. **(Original)** The method of Claim 15, wherein said vacuum is maintained at pressure of between about 2 inches to 16 inches mercury.

23. **(Original)** The method of Claim 1, wherein said vacuum is maintained at a pressure of between about 5 inches to 10 inches mercury.

24. **(Original)** The method of Claim 15, wherein said vacuum is maintained at pressure of between about 5 inches to 10 inches mercury.
25. **(Original)** The method of Claim 1, wherein said hydrocarbon material is used rubber.
26. **(Original)** The method of Claim 1, wherein said hydrocarbon material is tar sands.
27. **(Original)** The method of Claim 1, wherein said hydrocarbon material is coal.
- 28-32 **(Withdrawn)**